



R.E.D. FACTS

Pesticide Reregistration

Trichlorfon

All pesticides sold or distributed in the United States must be registered by EPA (the Agency), based on scientific studies showing that they can be used without posing unreasonable risks to people or the environment. Because of advances in scientific knowledge, the law requires that pesticides which were first registered before November 1, 1984, be reregistered to ensure that they meet today's more stringent standards.

In evaluating pesticides for reregistration, the Agency obtains and reviews a complete set of studies from pesticide producers, describing the human health and environmental effects of each pesticide. The Agency develops any mitigation measures or regulatory controls needed to effectively reduce each pesticide's risks. The Agency then reregisters pesticides that can be used without posing unreasonable risks to human health or the environment.

When a pesticide is eligible for reregistration, the Agency explains the basis for its decision in a Reregistration Eligibility Decision (RED) document. This fact sheet summarizes the information in the RED document for reregistration case 0104, Trichlorfon.

Use Profile

Trichlorfon is an insecticide that historically has been used to control indoor and outdoor pests on agricultural, non-agricultural, residential and commercial sites. Through the RED process many uses have been voluntarily canceled. Those that are supported through reregistration include indoor non-food uses in residential and commercial institutions to control, among other pests, flies, roaches and ants. The outdoor uses of trichlorfon include treatment to ornamentals, golf courses and residential turf to control various Lepidopteran larvae pests. Also, trichlorfon may be used in various agricultural farm premise sites, such as kennels, chicken houses, dairy milking stalls and barns, but only in areas inaccessible to animals; these uses are predominantly for fly control. Trichlorfon may also be used as a mound treatment to control Harvester ants.

Trichlorfon may be formulated as a soluble powder, granular or bait. Soluble powders may be applied through ground boom sprayers and hand-held sprayers to turf and ornamentals or indoor spot treatments. Aerial application is prohibited for trichlorfon. All turf uses of trichlorfon now must include pre-treatment watering-in. The application of granular

formulations with chest-mounted rotary spreaders are prohibited based on potential health risks. Granular baits are used both indoors and outdoors by scattering in problem areas. The bait is also used as a mound treatment to control Harvester ants. The bait can no longer be used on residential lawns and all indoor residential use of bait must be through a prepackaged child-resistant bait station.

Regulatory History

Trichlorfon was first registered as a pesticide in the U.S. in 1955 by USDA. The Agency issued a Registration Standard for trichlorfon in June 1984. A 1991 Data Call-In (DCI) required additional data. Currently, 24 trichlorfon products are registered.

Human Health Assessment

Toxicity

In studies using laboratory animals, trichlorfon generally has been shown to be of moderate acute toxicity. It is moderate by the oral route and has been placed in Toxicity Category II (the second highest of four categories) for this effect. It is slightly toxic by the dermal route, Toxicity Category III and practically non-toxic by the dermal route, Toxicity Category IV. Trichlorfon causes moderate eye irritation, Toxicity Category III. It is classified as a moderate contact allergen with skin effects classified as Toxicity Category IV.

Dietary Exposure

People may be exposed to residues of trichlorfon through the diet. Tolerances or maximum residue limits have been established for many agricultural and livestock commodities (please see 40 CFR 180.198 and 186.2325). The Agency is proposing to revoke all tolerances for trichlorfon except cattle meat, cattle fat and cattle meat by-products. The registrant is not supporting the domestic use of the cattle treatment but will support the tolerances needed for the continuing importation of trichlorfon treated cattle products. In order to reassess the tolerances additional residue data are required within 24 months. Residue and metabolism data are required to reassess the tolerances, specifically, dermal metabolism in cattle (171-4b), magnitude of the residue for meat (171-4j), residue analytical method (171-4d), and storage stability (171-4e).

Occupational and Residential Exposure

Based on current use patterns, handlers (mixers, loaders, and applicators) may be exposed to trichlorfon during and after normal use of all formulations. The Agency has determined that there are unacceptable risks posed to handlers in several use scenarios. In response to these concerns, the registrant voluntarily canceled sod farm use and will prohibit aerial application and application of granular formulations with chest-

mounted rotary spreaders. Upon recommendation by the Agency, the registrants have agreed to voluntarily cancel domestic lawn use with the bait formulations. Also, indoor residential use of the bait formulation is prohibited unless housed in prepackaged bait stations. Additional PPE was required for handlers in other use scenarios.

Human Risk Assessment

Trichlorfon generally is of moderate acute toxicity and has been classified as a Group E, no evidence of carcinogenicity for humans. All trichlorfon food and feed crop uses have been voluntarily canceled. The only dietary exposure to trichlorfon residues in foods will be through imported cattle meat, cattle fat and cattle meat-by-products. However, the theoretical maximum residue contribution (TMRC) to the two highest exposed subgroups, children (1-6 years old) and non-nursing infants (< 1 year old) is relatively low, representing 14.33% and 7.32% of the RfD, respectively. These estimates indicate the import of trichlorfon treated cattle products does not present a chronic dietary risk.

The acute dietary exposure was estimated for the import of trichlorfon treated cattle using established tolerances and was determined to be very low. The estimated Margins of Exposure (MOEs) were greater than 10, suggesting that there is little likelihood of an appreciable acute dietary risk from the import of trichlorfon treated cattle products.

The Agency has determined that there is a concern for exposure to children and pets from the indoor residential uses of the bait formulations. In response, the Agency is requiring that all baits formulated for use inside residential dwellings must be housed in child-resistant bait stations. Baits not housed in child resistant packaging must include label statements restricting use from indoor residential areas.

The Agency has determined that there are mitigatable risks associated with mixer and loaders who handle the soluble powder formulation to support typical area (40 acres per day) application to turfgrass. The risk can be adequately mitigated with the additional PPE of chemical resistant gloves. Also, the risk to commercial mixers/loaders/applicators handling the granular formulation for application to turfgrass using push-type spreaders could be adequately mitigated with the additional PPE of double layer bodywear and chemical resistant gloves. The Agency also determined that there was unacceptable risk posed to handlers in several other exposure scenarios. In response to these concerns, the registrant voluntarily canceled sod farm use and will prohibit aerial application and application of granular formulations with chest-mounted rotary spreaders. Post-application reentry workers will be required to observe a 24-hour Restricted Entry Interval.

Environmental Assessment

Environmental Fate

Potential for contamination of groundwater by trichlorfon and trichlorfon degradates cannot be adequately assessed because acceptable field dissipation data are not available. Potential to leach is suggested by findings of high mobility in soil. Risk of contamination of surface and ground water may be moderated by rapid degradation of trichlorfon in soil and water. The major degradate in both soil and water is dichlorvos (DDVP) with desmethyl DDVP also reported as a degradate in soil. DDVP is itself a registered pesticide active ingredient.

Ecological Effects

On an acute basis, trichlorfon is highly toxic to moderately toxic to birds. Trichlorfon subacute dietary toxicity is classified as moderately toxic to practically non-toxic. Avian reproductive studies indicate that there will be effects on reproduction at levels of trichlorfon as low as 30 mg/L.

Trichlorfon was determined to have low toxicity to honey bees.

Acute toxicity measurements with trichlorfon range from highly toxic to practically non-toxic to freshwater fish. Chronic toxicity testing with fish indicate that the maximum allowable toxicant concentration (MATC) for trichlorfon is between 110 and 160 $\mu\text{g/L}$. Acute toxicity testing on aquatic invertebrates indicate that trichlorfon is very highly toxic to all test species except crayfish, to which it was found to be moderately toxic. Chronic toxicity testing with aquatic invertebrates indicate that the MATC for trichlorfon is between 5.6 and 8.6 ng/L.

Ecological Risk Assessment

Based on the exposure from the turf uses, acute risk levels of concern are exceeded for freshwater, marine and estuarine fish and invertebrates and birds. Chronic risk levels of concern are exceeded for freshwater invertebrates and birds. The registrant has agreed to require buffer strips from aquatic habitats, mandatory watering-in for turf sites to reduce surface run-off, the prohibition of aerial application which can result in spray drift and the prohibition of residential lawn use with the bait formulations. These measures will greatly reduce the exposure of aquatic habitats to trichlorfon as well as reduce the residues available for dietary consumption by birds. The acreage of trichlorfon usage has also been reduced by the cancellation of all field crops and sod farm use. The Agency has determined that although levels of concern are exceeded for non-target organisms, the exposure has been adequately mitigated.

Additional Data Required

The Agency is requiring the following additional generic studies for trichlorfon to confirm its regulatory assessments and conclusions: estuarine or marine mollusk acute toxicity study (72-3b), life cycle aquatic

invertebrate (72-4b), terrestrial field dissipation (164-1), evaluation of worker exposure from hydraulic low pressure handwand application (231 and 232) and worker reentry exposure from turf and greenhouse use (132-1, 133-3 and 133-4), droplet size spectrum (201) and drift field evaluation (202-1). Residue and metabolism data are required to reassess the cattle meat, cattle fat and cattle meat-by-products tolerances (171-4b, 171-4d, 171-4e, 171-4j).

The Agency also is requiring product-specific data including product chemistry and acute toxicity studies, revised Confidential Statements of Formula (CSFs), and revised labeling for reregistration.

Product Labeling Changes Required

All trichlorfon end-use products must comply with the Agency's current pesticide product labeling requirements and with the following. For a comprehensive list of labeling requirements, please see the trichlorfon RED document.

PPE/Engineering Control Requirements for Pesticide Handlers

For **sole-active-ingredient** end-use products that contain trichlorfon, the product labeling must be revised to adopt the handler personal protective equipment/engineering control requirements set forth in this section. Any conflicting PPE requirements on the current labeling must be removed.

Products Intended Primarily for Occupational Use (WPS and nonWPS)

Minimum (Baseline) PPE/Engineering Control Requirements

At this time there are no engineering control requirements, such as closed systems, currently required on labeling for trichlorfon products. The Agency is not establishing active-ingredient-based minimum (baseline) engineering control requirements for trichlorfon end-use products that are intended primarily for occupational use.

The Agency is establishing minimum (baseline) PPE for some occupational uses of trichlorfon.

For soluble powder formulations:

"Mixers and loaders must wear:

- long-sleeve shirt and long pants,
- chemical-resistant gloves*, and
- shoes plus socks,

Applicators and other handlers (other than mixers and loaders) must wear:

- long-sleeve shirt and long pants,
- shoes plus socks.

For granular formulations:

Applicators and other handlers must wear:

- coveralls over long-sleeve shirt and long pants,
- chemical-resistant gloves*, and
- chemical-resistant footwear.

For ready-to-use formulations:

Applicators and other handlers must wear:

- long-sleeve shirt and long pants,
- chemical-resistant gloves*, and
- shoes plus socks.

*For the glove statement, use the statement established for trichlorfon through the instruction in Supplement Three of PR Notice 93-7.

Determining PPE Requirements for End-use Product Labels

The PPE that would be established on the basis of the acute toxicity category of the end-use product must be compared to the active-ingredient-based minimum (baseline) personal protective equipment specified above. The more protective PPE must be placed on the product labeling. For guidance on which PPE is considered more protective, see PR Notice 93-7.

Placement in Labeling

The personal protective equipment requirements must be placed on the end-use product labeling in the location specified in PR Notice 93-7, and the format and language of the PPE requirements must be the same as is specified in PR Notice 93-7.

Products Intended Primarily for Homeowner Use

Minimum (Baseline) PPE Requirements

The Agency is not establishing active-ingredient-based minimum (baseline) handler PPE for trichlorfon end-use products that are intended primarily for homeowner use.

Determining PPE Requirements for End-Use Product Labels

Any necessary PPE for each trichlorfon end-use product intended primarily for homeowner use will be established on the basis of the end-use product's acute toxicity category.

Placement in Labeling

The personal protective equipment requirements, if any, must be placed on the end-use product labeling immediately following the precautionary statements in the labeling section "Hazards to Humans (and domestic animals)."

Entry Restrictions

For **sole-active-ingredient** end-use products that contain trichlorfon the product labeling must be revised to adopt the entry restrictions set forth in this section. Any conflicting entry restrictions on the current labeling must be removed.

Products Intended Primarily for Occupational Use

WPS Uses

Restricted-entry interval: A 24-hour restricted-entry interval (REI) is required for uses within the scope of the WPS on all trichlorfon end-use products.

"Exception: if the product is soil-injected or soil-incorporated (including watering-in), the Worker Protection Standard, under certain circumstances, allows workers to enter the treated area if there will be no contact with anything that has been treated."

Early-entry personal protective equipment (PPE): The PPE required for early entry is:

- coveralls over long-sleeve shirt and long pants,
- chemical-resistant gloves,
- chemical-resistant footwear plus socks.

Placement in labeling: The REI and the PPE required for early entry must be inserted into the standardized REI statement required by Supplement Three of PR Notice 93-7.

NonWPS uses

Entry restrictions: The Agency is establishing the following entry restrictions for nonWPS occupational uses of trichlorfon end-use products:

- **For liquid applications:**

"Do not enter or allow others to enter the treated area until sprays have dried."

- **For granular applications:**

"Do not allow people or pets to enter the treated area (except those involved in the watering) until the watering-in is complete and the surface is dry."

- **For bait applications:**

There are no entry restrictions.

Placement in labeling:

If WPS uses are also on label -- Follow the instructions in PR Notice 93-7 for establishing a Non-Agricultural Use Requirements box, and place the appropriate nonWPS entry restrictions in that box.

If no WPS uses are on the label -- Place the appropriate nonWPS entry restrictions in the Directions for Use, under the heading "Entry Restrictions".

Products Intended Primarily for Homeowner Use

Entry restrictions: The Agency is establishing the following entry restrictions for all homeowner uses of trichlorfon end-use products:

- For liquid applications:
"Do not allow people or pets to enter the treated area until sprays have dried."
- For granular applications:
"Do not allow people or pets to enter the treated area (except those involved in the watering) until the watering-in is complete and the surface is dry."

Placement in labeling: Place the appropriate entry restrictions in the Directions for Use, under the heading "Entry Restrictions".

Other Labeling Requirements

Products Intended Primarily for Occupational Use

The Agency is requiring the following labeling statements be located on all end-use products containing trichlorfon that are intended primarily for occupational use:

Application Restrictions:

For all formulations:

"Do not apply this product in a way that will contact workers or other persons, either directly or through drift. Only protected handlers may be in the area during application."

"Aerial application is prohibited."

For granular formulations only:

"Apply with push-type granular spreaders only. Chest-mounted rotary spreader ("belly-grinder") application equipment is prohibited."

User Safety Requirements:

{Registrant: select this if coveralls are required for pesticide handlers on the end-use product label:}

Discard clothing or other absorbent materials that have been drenched or heavily contaminated with this product's concentrate. Do not reuse them.

{Registrant: select this always:}

"Follow manufacturer's instructions for cleaning/maintaining PPE. If no such instructions for washables, use detergent and hot water. Keep and wash PPE separately from other laundry."

User Safety Recommendations:

- "Users should wash hands before eating, drinking, chewing gum, using tobacco, or using the toilet."
- "Users should remove clothing immediately if pesticide gets inside. Then wash thoroughly and put on clean clothing."

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- "Users should remove PPE immediately after handling this product. Wash the outside of gloves before removing. As soon as possible, wash thoroughly and change into clean clothing."

Skin Sensitizer Statement:

"This product may cause skin sensitization in some people."

Engineering Controls:

"When handlers use closed systems, or enclosed cabs in a manner that meets the requirements listed in the Worker Protection Standard (WPS) for agricultural pesticides (40 CFR 170.240(d)(4-6), the handler PPE requirements may be reduced or modified as specified in the WPS."

Products Intended Primarily for Home Use

Application Restrictions

"Do not apply this product in a way that will contact any person or pet, either directly or through drift. Keep people and pets out of the area during application."

"Do not apply this product using "chest mounted rotary-type spreader" application equipment."

User Safety Recommendations

- "Users should wash hands before eating, drinking, chewing gum, using tobacco, or using the toilet."
- "Users should remove clothing immediately if pesticide gets inside. Then wash thoroughly and put on clean clothing."

{Select this only if gloves and/or protective eyewear are required for homeowner users:}

- "Users should remove protective clothing and equipment immediately after handling this product. Wash the outside of gloves before removing. Keep and wash protective clothing and equipment separately from other laundry."

Skin Sensitizer Statement

"This product may cause skin sensitization reactions in some people."

Environmental Hazard Statements

All labels must have standard language, including:

"Do not apply directly to water, or to areas where surface water is present or to intertidal areas below the mean high water mark."

"Do not contaminate water by cleaning of equipment or disposal or wastes."

"Do not apply when turf grass areas are water logged or the soil is saturated with water (i.e. will not irrigate)."

"Avoid run-off or puddling of irrigation water following application."

Soluble powders:

"Do not apply when average wind speeds are greater than 15 mph."

"Apply product using spray nozzles which produce a coarse droplet size, such as flood jet nozzles or lawn care gun."

For Golf course Use:

"Do not apply within 25 feet of lakes, reservoirs, rivers, permanent streams, marshes natural ponds, or estuaries."

"Post-application watering-in is required."

For Other Turf/Lawn Uses:

"Post-application watering-in is required."

Premise Precautions

All products labeled for use in livestock premise or areas must include the following:

"Remove animals before using products as a premise spray treatment in barns."

"Do not treat areas such as drinking cup, mangers, or troughs where livestock feed."

"Do not contaminate water, food, feedstuffs, food or feed handling equipment, or milk or meat handling equipment."

"Do not apply bait or spray to areas accessible to animals."

All products labeled for use in indoor residential or commercial establishments must include:

"For use in non-food/non-feed areas."

"Do not contaminate food/feed or food/feed handling equipment."

"Do not use in the food/feed areas of food/feed handling establishments. Do not use in edible product areas of food or feed processing plants, restaurants or other areas where food or feed is commercially prepared for processed. Do not use in restaurant serving areas while food is exposed."

All bait formulation products not housed in child-resistant bait stations must include the following:

"Not for Indoor Residential Use" and

"Not for Lawn/Turf Use".

All products labeled for use as a mound treatment for Texas Harvest Ants must include the following:

"Apply only by hand-broadcast."

All products containing the site "area treatment" must be modified to "nonfood/nonfeed areas".

Regulatory Conclusion

The use of currently registered products containing trichlorfon, labeled for non-food uses as specified in the RED, will not pose unreasonable risks or adverse effects to humans or the environment. Therefore, all uses of these products with approved labeling, are eligible for reregistration.

Trichlorfon products will be reregistered once the required product-specific data, revised Confidential Statements of Formula, and revised labeling are received and accepted by the Agency.

For More Information

The Agency is requesting public comments on the Reregistration Eligibility Decision (RED) document for trichlorfon during a 60-day time period, as announced in a Notice of Availability published in the Federal Register. To obtain a copy of the RED document or to submit written comments, please contact the Pesticide Docket, Public Response and Program Resources Branch, Field Operations Division (7506C), Office of Pesticide Programs (OPP), US EPA, Washington, DC 20460, telephone 703-305-5805.

Electronic copies of the RED and this fact sheet can be downloaded from the Pesticide Special Review and Reregistration Information System at 703-308-7224. They also are available on the Internet on EPA's gopher server, *GOPHER.EPA.GOV*, or using ftp on *FTP.EPA.GOV*, or using WWW (World Wide Web) on *WWW.EPA.GOV*.

Printed copies of the RED and fact sheet can be obtained from EPA's National Center for Environmental Publications and Information (EPA/NCEPI), PO Box 42419, Cincinnati, OH 45242-0419, telephone 513-489-8190, fax 513-489-8695.

Following the comment period, the trichlorfon RED document also will be available from the National Technical Information Service (NTIS), 5285 Port Royal Road, Springfield, VA 22161, telephone 703-487-4650.

For more information about EPA's pesticide reregistration program, the trichlorfon RED, or reregistration of individual products containing trichlorfon, please contact the Special Review and Reregistration Division (7508W), OPP, US EPA, Washington, DC 20460, telephone 703-308-8000.

For information about the health effects of pesticides, or for assistance in recognizing and managing pesticide poisoning symptoms, please contact the National Pesticides Telecommunications Network (NPTN). Call toll-free 1-800-858-7378, between 9:30 am and 7:30 pm Eastern Standard Time, Monday through Friday.